1. An integrated electrofluidic system comprising:

an electronic control system mounted on a support platform;

a microfluidic system embedded in said platform and having an input and an output and at least one electrofluidic component; and

at least one electrical conductor carried by said platform for electrically interconnecting said electronic control system and said at least one electrofluidic component.

2. The integrated electrofluidic system of claim 1 in which said platform includes a plurality of laminated layers forming said embedded microfluidic system.

3. The integrated electrofluidic system of claim 1 in which said platform includes a polyimide material.

4. The integrated electrofluidic system of claim 1 in which said platform includes KAPTON®.

5. The integrated electrofluidic system of claim 2 in which said layers are laminated using a phenolic resin adhesive.

6. The integrated electrofluidic system of claim 5 in which said phenolic

resin adhesive is R/FLEX®.

7. The integrated electrofluidic system of claim 5 in which said phenolic resin adhesive is etched to a thickness of 3 to 10 μm.

8. The integrated electrofluidic system of claim 5 in which said phenolic resin adhesive is selectively removed from regions where bonding is undesirable between said layers and/or between a said layer and said electrofluidic component and/or a microfluidic component.

9. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a valve.

10. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a pump.

11. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a reservoir.

12. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a mixer.

13. The integrated electrofluidic system of claim 1 in which said microfluidic

system includes at least one channel.

14. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a filter.

15. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a dispenser.

16. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a reactor.

17. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a heater.

18. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a concentrator.

19. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a pressurizing device.

20. The integrated electrofluidic system of claim 1 in which said microfluidic system includes a cooling device.

21. The integrated electrofluidic system of claim 1 further including a sensor device integrated with said microfluidic system.

22. The integrated electrofluidic system of claim 21 in which said sensor device is embedded in said platform.

23. The integrated electrofluidic system of claim 21 in which said sensor device includes a flexure plate wave sensor.

24. The integrated electrofluidic system of claim 21 in which said sensor device includes a photoelectric sensor device.

25. The integrated electrofluidic system of claim 21 in which said sensor device includes an optical sensor device.

26. The integrated electrofluidic system of claim 21 in which said sensor device includes an electrochemical sensor device.

27. The integrated electrofluidic system of claim 21 in which said sensor device includes a temperature sensor device.

28. The integrated electrofluidic system of claim 21 in which said sensor device includes a pressure sensor device.

29. The integrated electrofluidic system of claim 21 in which said sensor device includes a flow sensor device.

30. The integrated electrofluidic system of claim 21 in which said sensor device includes a viscosity sensor device.

31. The integrated electrofluidic system of claim 21 in which said sensor device includes a mass sensor device.

32. The integrated electrofluidic system of claim 21 in which said sensor device includes a magnetic sensor device.

33. The integrated electrofluidic system of claim 21 in which said sensor device includes an acoustic sensor device.

34. The integrated electrofluidic system of claim 1 further including a dispenser device integrated with said microfluidic system.

35. The integrated electrofluidic system of claim 1 further including a heat exchange device integrated with said microfluidic system.

36. The integrated electrofluidic system of claim 34 in which said dispenser device includes a drug delivery device.

37. The integrated electrofluidic system of claim 1 further including a fuel cell device integrated with said microfluidic device.

38. An integrated electrofluidic system comprising:

an electronic control system mounted on a support platform;

a microfluidic system embedded in said platform and having an input and an output and at least one electrofluidic component;

at least one electrical conductor carried by said platform for electrically interconnecting said electronic control system and said at least one electrofluidic component; and

a sensor integrated with said electrofluidic system.

39. The integrated electrofluidic system of claim 38 in which said platform includes a plurality of laminated layers forming said embedded microfluidic system.

40. An integrated electrofluidic system comprising:

an electronic control system mounted on a support platform;

a microfluidic system embedded in said platform and having an input and an output and at least one electrofluidic component;

at least one electrical conductor carried by said platform for electrically interconnecting said electronic control system and said at least one electrofluidic component; and

a dispenser device integrated said electrofluidic system.

41. The integrated electrofluidic system of claim 40 in which said platform includes a plurality of laminated layers forming said embedded microfluidic system.

42. The integrated electrofluidic system of claim 40 in which said dispensing device dispenses fluid in the range of about 100 microliters to 100 picoliters.

43. The integrated electrofluidic system of claim 40 in which said dispensing device dispenses fluid at a rate of about 0.1 to 100 microliters/min.

44. An integrated electrofluidic system comprising:

an electronic control system mounted on a support platform;

a microfluidic system embedded in said platform and having an input and an output and at least one electrofluidic component;

at least one electrical conductor carried by said platform for electrically interconnecting said electronic control system and said at least one electrofluidic component; and

a heat exchange device integrated with said electrofluidic system.

45. The integrated electrofluidic system of claim 43 in which said platform includes a plurality of laminated layers forming said embedded microfluidic system.

46. A method for manufacturing an integrated electrofluidic system, the method comprising:

a) providing a substrate layer having an adhesive layer;

b) thinning said adhesive layer;

c) machining said adhesive layer and said substrate layer to create features that define at least one microfluidic component and/or at least one electronic component;

d) aligning said substrate layers;

e) laminating the layers to embed said microfluidic component and/or said electronic component between said layers; and

f) repeating steps a) through e) for a predetermined number of layers of said substrate and said adhesive layer.

47. The method of claim 46 in which said substrate layer is KAPTON®.

48. The method of claim 46 in which said adhesive layer is thinned by plasma etching.

49. The method of claim 46 in which said adhesive layer and said substrate are machined by applying an energy beam with a laser.

50. The method of claim 46 in which step a) further includes providing additional microfluidic component and/or an electronic component to be embedded

between said layers.

51. The method of claim 46 further including the step of attaching additional microfluidic components and/or electronic components to the top surface of said laminated layers.

52. The method of claim 46 further including the step of applying a mask to said adhesive layer to define removal of said adhesive and to further define said microfluidic components.

53. The method of claim 46 in which step a) further includes providing electrical pads and electrical leads for interconnecting said microfluidic components and said electronic components.

54. The method of claim 46 further including the step of attaching electrical pads and electrical leads to the surface of said laminated layers.

55. The method of claim 49 in which said machining includes raster scanning to define said features.

56. The method of claim 55 further including the step of controlling the depth of said features by modifying said raster path.

57. The method of claim 46 further including the step of removing residual carbon and cleaning said substrate layers.

58. The method of claim 46 further including the step of tacking the layers.

59. The method of claim 46 wherein said machining includes depositing and patterning thin films of material on said substrate layer to form said electronic components.

60. The method of claim 59 in which said material is chosen from the group consisting of titanium, chrome, gold, platinum, tungsten, copper and nickel.

61. The method of claim 59 in which said material is plated with a material including copper.

62. The method of claim 60 further including the step of depositing a thin film of said material on said substrate layer to form an electric heater.

63. The method of claim 62 further including the step of depositing a thin film of said material on said substrate layer to form an electric cooling device.

64. The method of claim 46 in which step c) further includes applying a chemically functional coating to said substrate.

65. The method of claim 64 in which said chemically functional coating is chosen from the group consisting of: polymers, antibodies, human IgG or animal IgG, antibody fragments, antigens, antigen fragments, peptides, aptamers, single-stranded DNA (ssDNA), and biomolecules.